
	Division of Environmental Health and Communicable Disease Prevention	
	Section: 4.0 Diseases and Conditions	New 7/03
	Subsection: Measles	Page 1 of 9

Measles (Rubeola) (10-Day) Table of Contents

Measles
Rash Investigation (IMMP-4)

	Division of Environmental Health and Communicable Disease Prevention	
	Section: 4.0 Diseases and Conditions	New 7/03
	Subsection: Measles	Page 2 of 9

Measles (Rubeola) (10-Day)

Overview

For a more complete description of measles, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM)
- Red Book, Report of the Committee of Infectious Diseases
- “Pink Book,” Epidemiology and Prevention of Vaccine-Preventable Diseases

Case Definition ⁽⁴⁾

Clinical description

An acute illness characterized by a temperature of 38.3° C (101° F) or more, cough, coryza, conjunctivitis, an erythematous maculopapular rash lasting 3 days or more, and a pathognomonic enanthem (Koplic spots).

Laboratory criteria for diagnosis

Diagnosed by a positive serologic test result for measles immunoglobulin (IgM) antibody, a significant increase in measles IgG antibody in paired acute (collected within 4 days of rash onset) and convalescent (collected 2 to 4 weeks later) serum specimens by any standard serology assay, or isolation of measles virus from clinical specimens such as urine, blood or nasopharyngeal secretions. Specimens for IgM testing should be drawn at least 72 hours after onset of rash. ⁽³⁾

Case classification

Confirmed: A case that is laboratory-confirmed.


Probable: A clinically compatible case (38.3° C/101° F or more temperature, cough, coryza and conjunctivitis) that is epidemiologically linked to a confirmed case.

Suspect: Any febrile illness accompanied by a rash.

Comment

Measles is a category I disease, reportable within 24 hours of first knowledge or suspicion. Missouri State Laboratory reports are submitted automatically to the Section of Communicable Disease Prevention (SCDP). Private laboratory results must be submitted to the SCDP as soon as possible with the disease investigation form.

Both probable and confirmed cases are reported to the Centers for Disease Control.

	Division of Environmental Health and Communicable Disease Prevention	
	Section: 4.0 Diseases and Conditions	New 7/03
	Subsection: Measles	Page 3 of 9

Information Needed for Investigation

Verify the diagnosis. What laboratory tests were conducted and what were the results? Does this illness meet case definition?

Establish the extent of illness. Is the patient properly vaccinated? Are there any other persons with a similar illness?

Contact the Regional Communicable Disease Coordinator assigned to your area.

Contact the Bureau of Child Care, if cases are associated with a childcare facility.

Case/Contact Follow Up and Control Measures

Determine the source of infection:


- Is the case aware of other persons with like illnesses?
- Has the case traveled outside the immediate area during the exposure period (12-17 days prior to when rash first appeared)?
- Did the case attend any group meetings or gatherings during the exposure period (12-17 days prior to when rash first appeared)?

Control Measures

- See the Measles section of the Control of Communicable Disease Manual (CCDM), “Control of patient, contacts, and the immediate environment.”
- See the Measles section of the Red Book.

General

- Case is communicable from four days prior to four days after appearance of rash; maximum communicability occurs from onset of prodrome through the first 3-4 days of rash.
- Identification of contacts during communicable period is of great importance to the success of the control effort.
- Determination of immunization status of contacts assists with the prevention of possible additional cases.
- Unimmunized (not having had 2 doses of measles-containing vaccine at least one month apart) and contacts with questionable immunization status are priorities for being vaccinated.
- If case attends School or Day Care/Preschool, immunization records should be audited to determine questionable immunization status of other attendees.
- If hospitalized, caregivers’ immunization status should be evaluated and precautions taken.

	Division of Environmental Health and Communicable Disease Prevention	
	Section: 4.0 Diseases and Conditions	New 7/03
	Subsection: Measles	Page 4 of 9

Laboratory Procedures

Collect clinical serum specimens for an IgM or paired IgG tests in a “red-topped” tube and submit to the state laboratory. If the clinic has contracts requiring the use of a private lab, split the specimens, sending one to the state lab and one to the private lab. At the same visit when the serum is taken, specimens for virus isolation can and should be taken; however, urine or nasopharyngeal or throat-swab specimens should not be substituted for serum specimens for measles diagnosis. Specimens for IgM testing should be drawn at least 72 hours after onset of rash. ⁽³⁾


Reporting Requirements

Measles is a category I disease reportable within 24 hours of first knowledge or suspicion to the local health authority or to the Department of Health and Senior Services.

1. For suspect, probable and confirmed cases complete a Disease Case Report (CD-1) and “Rash Investigation” (IMMP-4) form revised 1/98.
2. Entry of the CD-1 into MOHSIS negates the need for the paper CD-1 to be forwarded to a Regional Health Office.
3. Send the completed IMMP-4 “Rash Investigation” forms to the Regional Health Office.
4. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax, or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
5. Within 90 days of the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

References

1. James Chin, ed. “Measles” (Rubeola, Hard Measles, Red Measles, Morbilli), Control of Communicable Diseases Manual, 17th ed. Washington D.C.: American Public Health Association. 2000: 330-335.
2. American Academy of Pediatrics, “Measles.” In: Pickering, LK, ed. 2000 Red Book: Report of the Committee of Infectious Diseases. 25th Ed. Elk Grove Village, IL. 2000: 385-396.
3. Epidemiology and Prevention of Vaccine-Preventable Diseases, 7th Edition. Centers for Disease Control, Atlanta, Georgia. January 2002: 96-114.
4. Centers for Disease Control. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 1997;46 (RR-10): 23.

	Division of Environmental Health and Communicable Disease Prevention	
	Section: 4.0 Diseases and Conditions	New 7/03
	Subsection: Measles	Page 5 of 9

Other Sources of Information

Web Sites

1. Centers for Disease Control, National Immunization Program:
<http://www.CDC.gov/nip/default.htm> (05 June 2003)
2. Immunization Action Coalition: <http://www.immunize.org> (05 June 2003)
3. Karolinska Institutet - Alphabetic List of Specific Diseases/Disorders
<http://www.mic.ki.se/Diseases/alphalist.html> (05 June 2003)
4. Pamela Dyne, MD, Measles, Pediatric eMedicine Journal, April 17, 2003,
<http://www.emedicine.com/emerg/topic389.htm> (05 June 2003)



MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
OFFICE OF SURVEILLANCE
RASH INVESTIGATION

FINAL DIAGNOSIS <input type="checkbox"/> MEASLES <input type="checkbox"/> RUBELLA <input type="checkbox"/> OTHER (SPECIFY) _____						CASE NO.					
						DATE FIRST REPORTED TO HEALTH DEPARTMENT					
NAME OF INVESTIGATOR				HEALTH DEPARTMENT		DATE CASE INVESTIGATION BEGAN					
DEMOGRAPHICS											
PATIENT NAME				RACE <input type="checkbox"/> NATIVE AMER/ALASKAN NATIVE <input type="checkbox"/> WHITE <input type="checkbox"/> ASIAN/PACIFIC ISLANDER <input type="checkbox"/> OTHER <input type="checkbox"/> AFRICAN AMERICAN <input type="checkbox"/> UNKNOWN		ETHNICITY <input type="checkbox"/> HISPANIC <input type="checkbox"/> NOT HISPANIC <input type="checkbox"/> UNKNOWN					
PARENT'S NAME (IF NOT ADULT)											
DOB		AGE						SEX			
ADDRESS				CITY							
COUNTY		STATE		ZIP CODE		REPORTING INFORMATION					
HOME PHONE		BUSINESS PHONE		REPORTED BY							
SCHOOL/CHILD CARE/HEAD START				ADDRESS							
FAMILY PHYSICIAN		TELEPHONE NUMBER									
ADDRESS				TELEPHONE NUMBER		DATE OF REPORT					
CLINICAL DATA											
<input type="checkbox"/> IMPORTED <input type="checkbox"/> INDIGENOUS (ACQUIRED IN USA REPORTING STATE) <input type="checkbox"/> INTERNATIONAL (ACQUIRED OUTSIDE USA) <input type="checkbox"/> OUT OF STATE (ACQUIRED IN USA OUTSIDE REPORTING STATE) <input type="checkbox"/> UNKNOWN				CASE STATUS <input type="checkbox"/> CONFIRMED <input type="checkbox"/> SUSPECTED <input type="checkbox"/> PROBABLE <input type="checkbox"/> UNKNOWN							
FEVER (HIGHEST RECORDED)		FEVER DURATION		FEVER ONSET (MONTH/DAY/YEAR)		RASH ONSET (MONTH/DAY/YEAR)		RASH DURATION (DAYS)			
FIRST LOCATION OF RASH		SPREAD OF RASH				DRUGS BEFORE RASH (SPECIFY) <input type="checkbox"/> YES <input type="checkbox"/> NO					
DESCRIBE THE RASH											
<input type="checkbox"/> REDDISH		<input type="checkbox"/> COULD BE FELT		<input type="checkbox"/> WATERY VESICLES							
<input type="checkbox"/> DUSKY BROWN		<input type="checkbox"/> DISTINCT AND EVENLY DISTRIBUTED		<input type="checkbox"/> OTHER (SPECIFY) _____							
<input type="checkbox"/> MARKED ITCHING		<input type="checkbox"/> SOME DISCRETE LESIONS, AND SOME AREAS BLOTCHY AND CONFLUENT									
SYMPTOMS											
	YES	NO	UNKNOWN		YES	NO	UNKNOWN		YES	NO	UNKNOWN
Cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nausea and/or vomiting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Swollen lymph glands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Runny Nose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Was the patient very sick?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Behind the ear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watery or red eyes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Malaise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Back of neck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did fever continue after rash onset?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sore Throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Back of head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Photophobia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Koplik spots before rash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arthralgia/Arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				Date seen _____							
				By whom _____							

COMPLICATIONS

	YES	NO	UNKNOWN		YES	NO	UNKNOWN
Diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Physician Visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DATE OF VISIT	PHYSICIAN NAME		
Encephalitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PHYSICIAN ADDRESS			
Otitis Media	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		YES	NO	UNKNOWN
Hospitalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Atypical Measles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date _____				Death	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____				DATE OF DEATH	CAUSE OF DEATH		

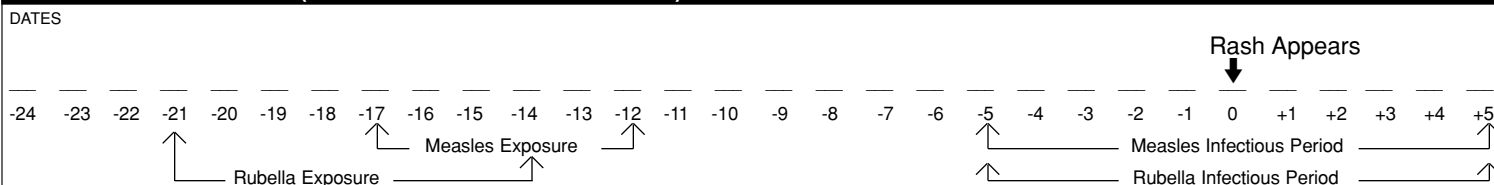
LABORATORY

WAS TESTING FOR RUBELLA OR MEASLES DONE?			PLEASE SPECIFY DISEASE		
<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> UNKNOWN	<input type="checkbox"/> MEASLES	<input type="checkbox"/> RUBELLA	
DATE IgM SPECIMEN TAKEN			IgM RESULT		
MONTH	DAY	YEAR	<input type="checkbox"/> POSITIVE	<input type="checkbox"/> INDETERMINANT	<input type="checkbox"/> NOT DONE
			<input type="checkbox"/> NEGATIVE	<input type="checkbox"/> PENDING	<input type="checkbox"/> UNKNOWN
DATE IgG ACUTE SPECIMEN TAKEN			IgG RESULT		
MONTH	DAY	YEAR	<input type="checkbox"/> SIGNIFICANT RISE IN IgG	<input type="checkbox"/> INDETERMINANT	<input type="checkbox"/> NOT DONE
			<input type="checkbox"/> NO SIGNIFICANT RISE IN IgG	<input type="checkbox"/> PENDING	<input type="checkbox"/> UNKNOWN
DATE IgG CONVALESCENT SPECIMEN TAKEN			SPECIFY OTHER LAB METHOD		
MONTH	DAY	YEAR	OTHER RESULTS		
			<input type="checkbox"/> POSITIVE	<input type="checkbox"/> INDETERMINANT	<input type="checkbox"/> NOT DONE
			<input type="checkbox"/> NEGATIVE	<input type="checkbox"/> PENDING	<input type="checkbox"/> UNKNOWN
WAS CASE LABORATORY CONFIRMED?					
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN					

VACCINE HISTORY

HAD CASE EVER RECEIVED MEASLES/RUBELLA-CONTAINING VACCINE?					
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN					
VACCINATION DATE (MONTH/DAY/YEAR)			IF CASE WAS NOT VACCINATED, WHAT WAS THE REASON?		
1.	3.		<input type="checkbox"/> RELIGIOUS EXEMPTION	<input type="checkbox"/> LABORATORY EVIDENCE OF PREVIOUS DISEASE	<input type="checkbox"/> PARENTAL REFUSAL
			<input type="checkbox"/> MEDICAL CONTRAINDICATION	<input type="checkbox"/> PHYSICIAN DIAGNOSIS OF PREVIOUS DISEASE	<input type="checkbox"/> OTHER
2.	4.		<input type="checkbox"/> PHILOSOPHICAL EXEMPTION	<input type="checkbox"/> UNDER AGE FOR VACCINATION	<input type="checkbox"/> UNKNOWN
NUMBER OF DOSES RECEIVED BEFORE FIRST BIRTHDAY			NUMBER OF DOSES RECEIVED ON OR AFTER FIRST BIRTHDAY		
IF VACCINATED BEFORE FIRST BIRTHDAY, BUT NO DOSES GIVEN ON OR AFTER FIRST BIRTHDAY, WHAT WAS REASON?					
<input type="checkbox"/> RELIGIOUS EXEMPTION		<input type="checkbox"/> LABORATORY EVIDENCE OF PREVIOUS DISEASE		<input type="checkbox"/> PARENTAL REFUSAL	
<input type="checkbox"/> MEDICAL CONTRAINDICATION		<input type="checkbox"/> PHYSICIAN DIAGNOSIS OF PREVIOUS DISEASE		<input type="checkbox"/> OTHER	
<input type="checkbox"/> PHILOSOPHICAL EXEMPTION		<input type="checkbox"/> UNDER AGE FOR VACCINATION		<input type="checkbox"/> UNKNOWN	
IF RECEIVED ONE DOSE AFTER FIRST BIRTHDAY, BUT NEVER RECEIVED SECOND DOSE AFTER FIRST BIRTHDAY, WHAT WAS REASON?					
<input type="checkbox"/> RELIGIOUS EXEMPTION		<input type="checkbox"/> LABORATORY EVIDENCE OF PREVIOUS DISEASE		<input type="checkbox"/> PARENTAL REFUSAL	
<input type="checkbox"/> MEDICAL CONTRAINDICATION		<input type="checkbox"/> PHYSICIAN DIAGNOSIS OF PREVIOUS DISEASE		<input type="checkbox"/> OTHER	
<input type="checkbox"/> PHILOSOPHICAL EXEMPTION		<input type="checkbox"/> UNDER AGE FOR VACCINATION		<input type="checkbox"/> UNKNOWN	

EPI INFECTIOUS CHART (To Assist in Case Determination)



SOURCE OF INFECTION							
ONSET OF RASH	EXPOSURE PERIOD (ENTER DATES) _____ TO _____						
							YES NO UNKNOWN
Was there any known exposure to measles, rubella, or similar illness during the exposure period?							<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Was there travel outside of the local community during the exposure period?							<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Was there any attendance at any group meetings or gatherings during the exposure period?							<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If yes to any questions, give details in the contact section.							
ACTIVITY HISTORY FOR 18 DAYS BEFORE RASH ONSET AND 7 DAYS AFTER RASH ONSET							
	DATE		DATE				
<input type="checkbox"/> CHURCH		<input type="checkbox"/> SCHOOL (SPECIFY)					
<input type="checkbox"/> GROUP MEETINGS							
<input type="checkbox"/> BABYSITTER		<input type="checkbox"/> OTHER (SPECIFY)					
<input type="checkbox"/> FAMILY GATHERING							
EPIDEMIOLOGY INFORMATION							
TRANSMISSION SETTING (WHERE DID THIS CASE ACQUIRE MEASLES?)							
<input type="checkbox"/> CHILD CARE	<input type="checkbox"/> HOSPITAL WARD	<input type="checkbox"/> HOME	<input type="checkbox"/> COLLEGE	<input type="checkbox"/> CHURCH			
<input type="checkbox"/> SCHOOL	<input type="checkbox"/> HOSPITAL ER	<input type="checkbox"/> WORK	<input type="checkbox"/> MILITARY	<input type="checkbox"/> INTERNATIONAL TRAVEL			
<input type="checkbox"/> DOCTOR'S OFFICE	<input type="checkbox"/> HOSPITAL OUTPATIENT CLINIC	<input type="checkbox"/> UNKNOWN	<input type="checkbox"/> CORRECTIONAL FACILITY	<input type="checkbox"/> OTHER			
IF TRANSMISSION SETTING NOT AMONG THOSE LISTED AND KNOWN, WHAT WAS TRANSMISSION SETTING?							
OUTBREAK RELATED <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN		IF YES, OUTBREAK NAME (NAME OF OUTBREAK THIS CASE IS ASSOCIATED WITH)					
SOURCE OF EXPOSURE FOR CURRENT CASE							
EPI-LINKED TO ANOTHER CONFIRMED OR PROBABLE CASE <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN		IS CASE TRACEABLE WITHIN 2 GENERATIONS TO AN INTERNATIONAL IMPORTATION? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN					
PRIMARY AND HOUSEHOLD CONTACTS (INCLUDES CONTACTS/FRIENDS WITH SIMILAR ILLNESS)							
NAME	ADDRESS	RELATION	PHONE	AGE	VACCINE TYPE AND DATE	FOLLOW-UP CALL DATE	DATE OF EXPOSURE
DID YOU RECOMMEND MEASLES VACCINE FOR SUSCEPTIBLE CONTACT? <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, WHY?							
DID YOU CALL SURROUNDING SCHOOLS/CHILD CARES/HEAD STARTS TO ALERT THEM AND TO FIND OTHER CASES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, WHY?							
DID YOU NOTIFY LOCAL PHYSICIANS TO ALERT THEM AND TO REQUEST PROMPT REPORTS OF ADDITIONAL CASES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, WHY?							
DID YOU REQUEST PUBLICITY FROM THE MEDIA? <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, WHY?							

RUBELLA FORM FOR PREGNANT WOMEN

WAS THE CASE A PREGNANT WOMAN?

☐ YES ☐ NO ☐ UNKNOWN

NUMBER OF WEEKS GESTATION (OR TRIMESTER) AT ONSET OF ILLNESS

PRIOR EVIDENCE OF SEROLOGICAL IMMUNITY

YEAR OF TEST OR AGE OF PATIENT AT TIME OF TEST

☐ YES ☐ NO ☐ UNKNOWN

WAS PREVIOUS RUBELLA SEROLOGICALLY CONFIRMED?

YEAR OF DISEASE OR AGE OF PATIENT AT TIME OF DISEASE

☐ YES ☐ NO ☐ UNKNOWN

NOTES

- Age

Age of patient at rash onset in number of years, months, weeks, or days.
- Outbreak
(Measles)(Rubella)

≥ 3 cases (with at least one laboratory confirmed case) clustered in space and time.
- Death

If patient died from measles or rubella, verification with the physician is recommended.
- Source of exposure

A source case must be either a confirmed or probable case and have had face to face contact with a subsequent generation case. Exposure must have occurred 7 to 18 days before rash onset of the new case, and between 4 days before rash onset and 7 days after rash of the source case.
- Epi-linked

An epi-linked case is either a source case or same generation case. Epi-linkage is characterized by direct face to face contact. For same generation cases that are epi-linked a common exposure is likely.

COMMENTS

DATE CASE FIRST REPORTED TO STATE			FORM COMPLETED BY	TELEPHONE	DATE FORM COMPLETED		
MONTH	DATE	YEAR		()	MONTH	DATE	YEAR